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化學實驗室-高雄 Chemical Laboratory - Kao., SGS Taiwan Ltd.

試驗報告

Test Report

號碼(No.) : KA/2018/52076 日期(Date) : 2018/06/08

頁數(Page): 1 of 17

中國鋼鐵股份有限公司
CHINA STEEL CORPORATION
高雄市小港區中鋼路1號

1 CHUNG KANG ROAD, HSIAO KANG, KAOHSIUNG 81233, TAIWAN, REPUBLIC OF CHINA

以下測試樣品係由客戶送樣，且由客戶聲稱並經客戶確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

樣品名稱(Sample Description)	:	熱軋產品 HOT-ROLLED PRODUCT
樣品型號(Style/Item No.)	:	酸洗塗油鋼捲 PO COIL
收件日期(Sample Receiving Date)	:	2018/05/28
測試期間(Testing Period)	:	2018/05/28 TO 2018/06/08
送樣廠商(Sample Submitted By)	:	中國鋼鐵股份有限公司 (CHINA STEEL CORPORATION)

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).

Ray Chang



報告簽署人/Ray Chang, Ph.D./Manager-Tech
Signed for and on behalf of TAIWAN
SGS Taiwan Limited

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測試結果(Test Results)

測試部位(PART NAME) NO. 1 : 銀色金屬 (SILVER COLORED METAL)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result) NO. 1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n. d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5: 2013, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n. d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4: 2013, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n. d.
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	µg/cm ²	參考IEC 62321-7-1:2015, 以UV-VIS檢測。 / With reference to IEC 62321-7-1:2015 and performed by UV-VIS.	0.10	n. d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	µg/kg	參考IEC 62321-8:2017, 以氣相層析儀/質譜儀檢測。 / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n. d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n. d.
鄰苯二甲酸丁苄基酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n. d.
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di-(2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n. d.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS)	mg/kg	參考US EPA 3550C: 2007, 以液相層析/質譜儀檢測。 / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n. d.
全氟辛酸(鎂) / PFOA (CAS No.: 335-07-1)	mg/kg		10	n. d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result) NO. 1	
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6:2015, 以氣相層析/質譜儀檢測。 / With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n. d.	
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n. d.	
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n. d.	
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n. d.	
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n. d.	
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n. d.	
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n. d.	
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n. d.	
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n. d.	
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n. d.	
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n. d.	
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		參考BS EN 14582:2016, 以離子層析儀分析。 / With reference to BS EN 14582:2016. Analysis was performed by IC.	-	n. d.
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg			5	n. d.
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg			5	n. d.
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg			5	n. d.
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg			5	n. d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg			5	n. d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg			5	n. d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg			5	n. d.
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg			5	n. d.
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg	5		n. d.	
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg	5	n. d.		
鹵素 / Halogen					
鹵素(氟) / Halogen-Fluorine (F) (CAS No. : 14762-94-8)	mg/kg		50	n. d.	
鹵素(氯) / Halogen-Chlorine (Cl) (CAS No. : 22537-15-1)	mg/kg		50	n. d.	
鹵素(溴) / Halogen-Bromine (Br) (CAS No. : 10097-32-2)	mg/kg		50	n. d.	
鹵素(碘) / Halogen-Iodine (I) (CAS No. : 14362-44-8)	mg/kg		50	n. d.	

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
石棉 / Asbestos				NO. 1
溫石棉(白石綿) / Chrysotile (CAS No. : 12001-29-5)	%	參考EPA 600/R-93/116 (1993) / 立體顯 微鏡 (SM), 分散染色式偏光顯微鏡 (DS- PLM)及X光繞射光譜分析法 (XRD) / With reference to EPA 600/R-93/116 (1993). Analysis was performed by Stereo Microscope (SM), Dispersion Staining Polarized Light Microscope (DS-PLM) and X-ray Diffraction Spectrometer (XRD).	-	Negative
鐵石棉(褐石棉) / Amosite (CAS No. : 12172-73-5)	%		-	Negative
青石棉 / Crocidolite (CAS No. : 12001-28-4)	%		-	Negative
斜方角閃石棉 / Anthophyllite (CAS No. : 77538-67-5)	%		-	Negative
透閃石棉 / Tremolite (CAS No. : 77536-68-6)	%		-	Negative
陽起石棉 / Actinolite (CAS No. : 77538-86-4)	%		-	Negative
總鉛 / Lead (Pb)	mg/kg	參考CPSC-CH-E1001-08.3 (2012), 以感 應耦合電漿原子發射光譜儀檢測。 / With reference to CPSC-CH-E1001-08.3 (2012). Analysis was performed by ICP-AES.	2	n.d.
溶出銻 / Soluble Antimony (Sb)	mg/kg	參考ASTM F963 (2016) Clause 8.3, 以 感應耦合電漿原子發射光譜儀檢測。 / With reference to ASTM F963 (2016) Clause 8.3. Analysis was performed by ICP-AES.	5	n.d.
溶出砷 / Soluble Arsenic (As)	mg/kg		2.5	n.d.
溶出鋇 / Soluble Barium (Ba)	mg/kg		10	n.d.
溶出鎘 / Soluble Cadmium (Cd)	mg/kg		5	n.d.
溶出鉻 / Soluble Chromium (Cr)	mg/kg		5	n.d.
溶出鉛 / Soluble Lead (Pb)	mg/kg		5	n.d.
溶出汞 / Soluble Mercury (Hg)	mg/kg		5	n.d.
溶出硒 / Soluble Selenium (Se)	mg/kg		5	n.d.
紅磷 / Red phosphorus	**	以熱裂解-氣相層析/質譜儀分析。 / Analysis was performed by Pyrolyzer- GC/MS.	-	Negative
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3052, 用感應耦合電漿原子 發射光譜儀檢測。 / With reference to US EPA 3052. Analysis was performed by ICP-AES.	2	n.d.

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備註(Note) :

1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. (#2) =
 - a. 當六價鉻結果大於 $0.13 \mu\text{g}/\text{cm}^2$ ，表示樣品表層含有六價鉻。 / The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than $0.13 \mu\text{g}/\text{cm}^2$. The sample coating is considered to contain Cr(VI).
 - b. 當六價鉻結果為n.d. (濃度小於 $0.10 \mu\text{g}/\text{cm}^2$)，表示表層不含六價鉻。 / The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than $0.10 \mu\text{g}/\text{cm}^2$). The coating is considered a non-Cr(VI) based coating.
 - c. 當六價鉻結果介於 0.10 及 $0.13 \mu\text{g}/\text{cm}^2$ 時，無法確定塗層是否含有六價鉻。 / The result between $0.10 \mu\text{g}/\text{cm}^2$ and $0.13 \mu\text{g}/\text{cm}^2$ is considered to be inconclusive - unavoidable coating variations may influence the determination.
6. **= Qualitative analysis (No Unit) 定性分析(無單位)
7. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)
8. 石棉定性分析試驗範圍: 0.1%-100%，石棉鑑定的判定基準是以檢出含有石棉纖維為「Positive」，未檢出石棉纖維為「Negative」。 / Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".

PFOS參考資訊(Reference Information) : 持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物質或製備中不得超過0.001%(10ppm)，在半成品、成品或零件中不得超過0.1%(1000ppm)，在紡織品或塗層材料中不得超過 $1\mu\text{g}/\text{m}^2$ 。(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above $1\mu\text{g}/\text{m}^2$.)

全氟辛烷磺酸指全氟辛烷磺酸和它的衍生物包括全氟辛烷磺酸，全氟辛基磺酰胺，N-甲基全氟辛烷磺酰胺，N-乙基全氟辛烷磺酰胺，N-甲基全氟辛基磺酰基氨基乙醇，N-乙基全氟辛基磺酰基氨基乙醇。(PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.)

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德國產品安全委員會(AFPS) GS PAHs 要求 /

AFPS (German commission for Product Safety): GS PAHs requirements

項目 (Parameter)	第1類(Category 1)	第2類(Category 2)		第3類(Category 3)	
	意圖放入嘴內的材料或玩具會與皮膚有所接觸(超過30秒)。 (Material intended to be put in the mouth or toys with intended skin contact (longer than 30 s))	不屬於第1類的材料並可預見與皮膚接觸超過30秒(長期或經常與皮膚接觸)。(Materials not falling under category 1 with foreseeable contact to skin for longer than 30 seconds (long-term skin or frequent contact).)	對於2009/48/EC 之玩具 (Toy under 2009/48/EC)	對於德國產品安全法之其他產品 (Other products under ProdSG)	對於2009/48/EC 之玩具 (Toy under 2009/48/EC)
Naphthalene	< 1	< 2		< 10	
Acenaphthylene					
Acenaphthene					
Fluorene					
Phenanthrene	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Anthracene					
Fluoranthene					
Pyrene					
Benzo[a]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[b]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[j]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[k]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[a]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[e]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno[1,2,3-c,d] pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo[a,h]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[g,h,i]perylene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
18項PAH總濃度 (Sum of 18 PAH)	< 1	< 5	< 10	< 20	< 50

單位 (Unit) : mg/kg

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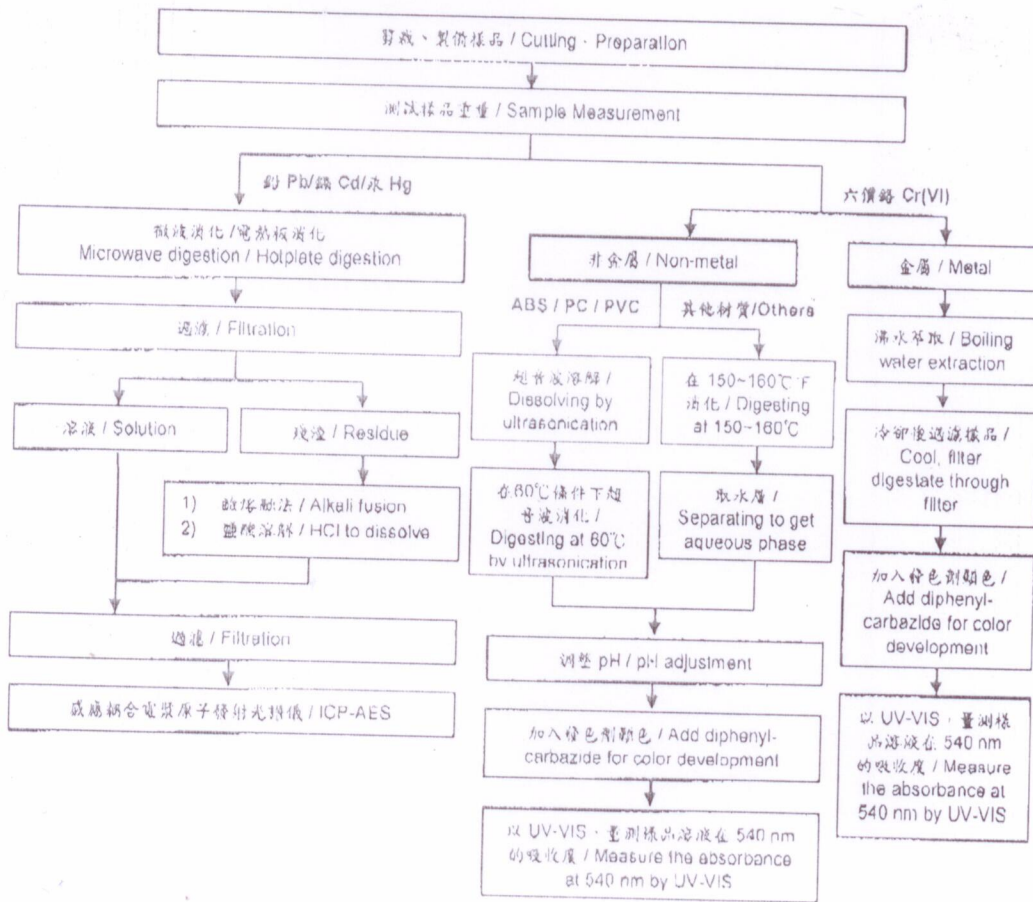
1 CHUNG KANG ROAD, HSIAO KANG, KAOHSIUNG 81233, TAIWAN, REPUBLIC OF CHINA

重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外)

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)

- 測試人員: 劉俊宏 / Technician: Jony Liu
- 測試負責人: 張伯章 / Supervisor: Ray Chang



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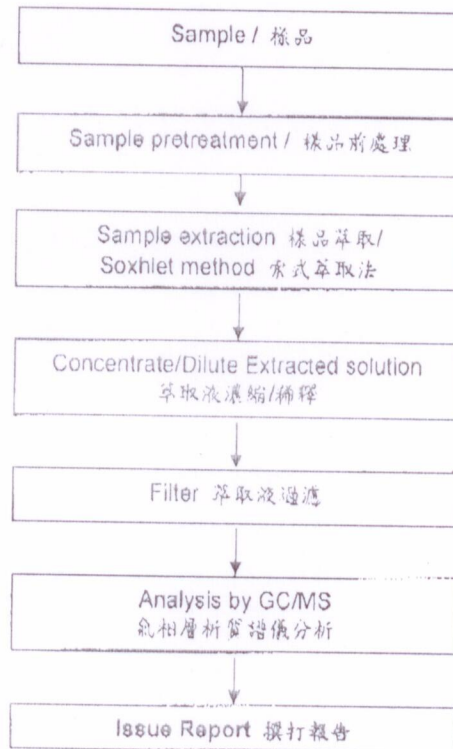
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多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART

- 測試人員: 陳威錚 / Technician: Dorothy Chen
- 測試負責人: 張伯睿 / Supervisor: Ray Chang



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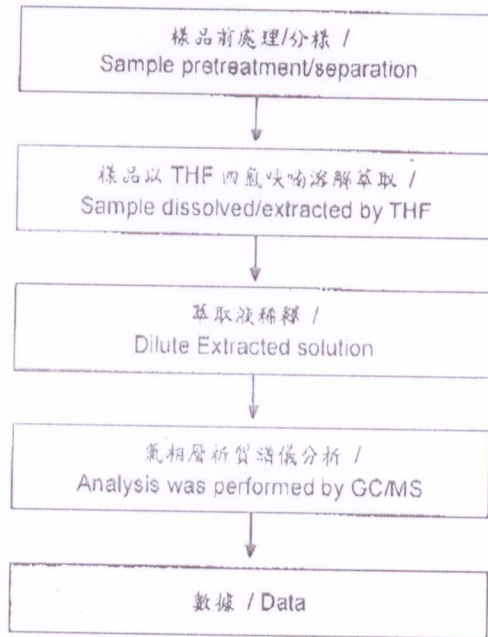
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

- 測試人員：陳威錚 / Technician : Dorothy Chen
- 測試負責人：張伯豪 / Supervisor : Ray Chang

【測試方法/Test method: IEC 62321-8】



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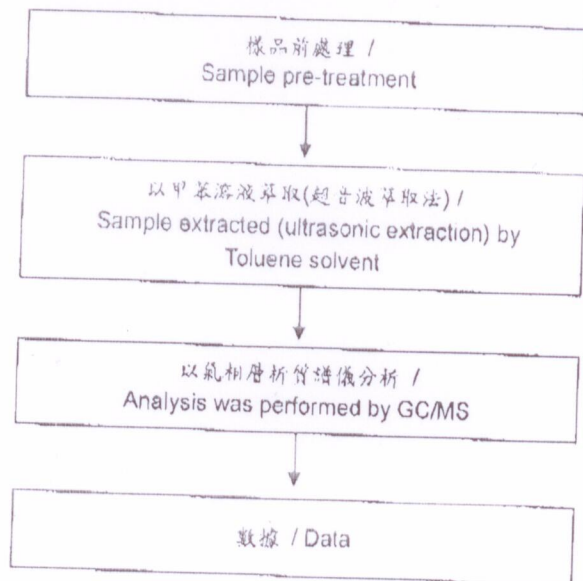
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多苯環芳香族化合物分析流程圖 / PAHs (Poly Aromatic Hydrocarbons) analytical flow chart

- 測試人員：陳威鈺 / Technician: Dorothy Chen
- 測試負責人：張伯睿 / Supervisor: Ray Chang



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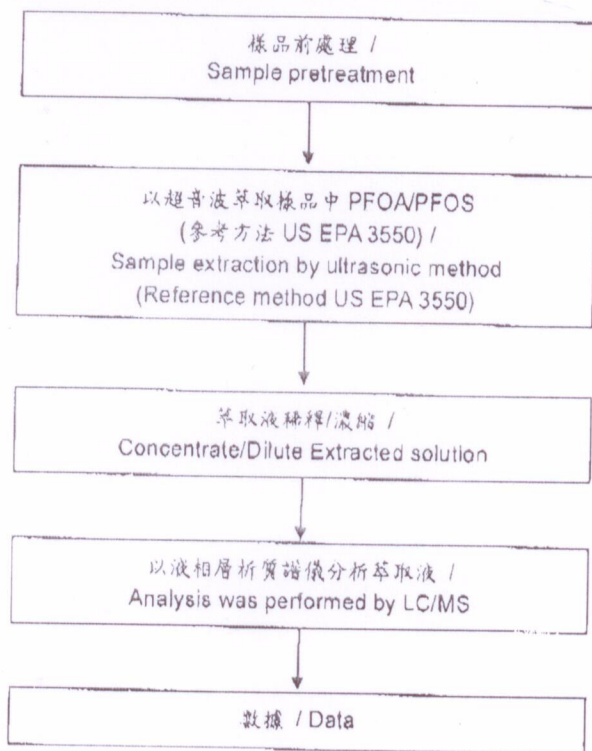
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全氟辛酸(鎂)/全氟辛烷磺酸分析流程圖 / Analytical flow chart of PFOA/PFOS content

- 測試人員：黃琮環 / Technician : Ginny Huang
- 測試負責人：張伯春 / Supervisor: Ray Chang



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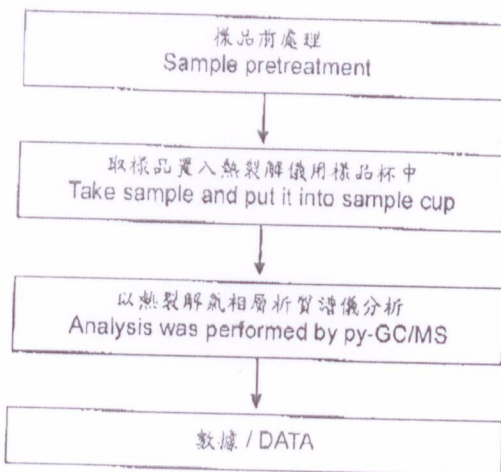
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紅磷分析流程 / Analytical flow chart of Red phosphorus

- 測試人員：涂雅琴 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang



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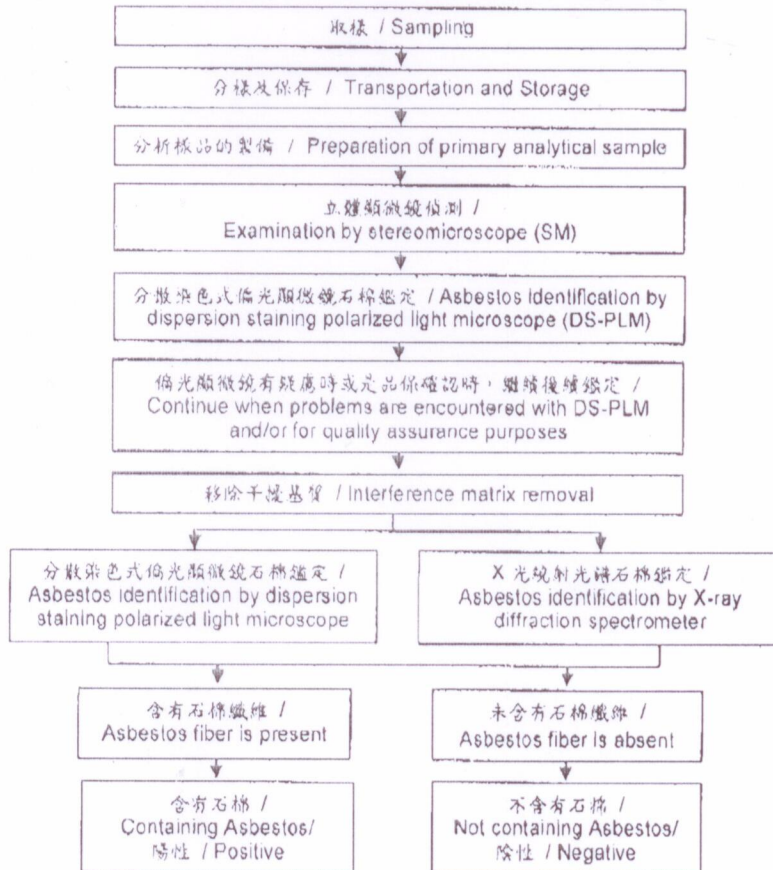
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石棉鑑定分析流程圖 / Analysis flow chart for determination of Asbestos

- 測試人員：高健忠 / Name of the person who made measurement: Victor Kao
- 測試負責人：魏明芬 / Name of the person in charge of measurement: Wendy Wei

【參考方法(Reference method): EPA 600/R-93/116】



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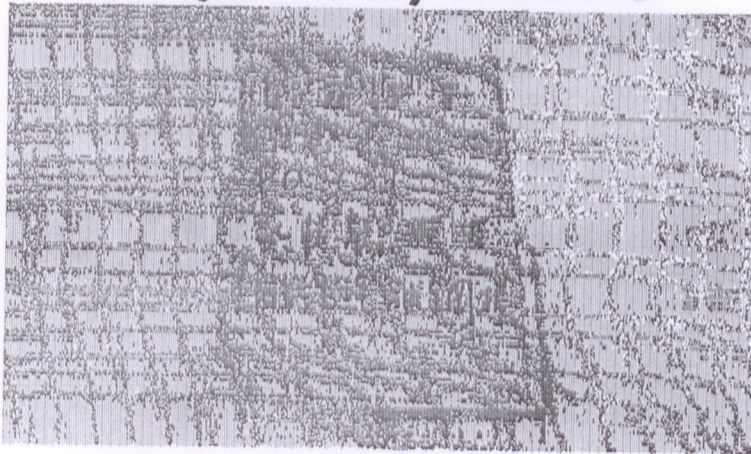
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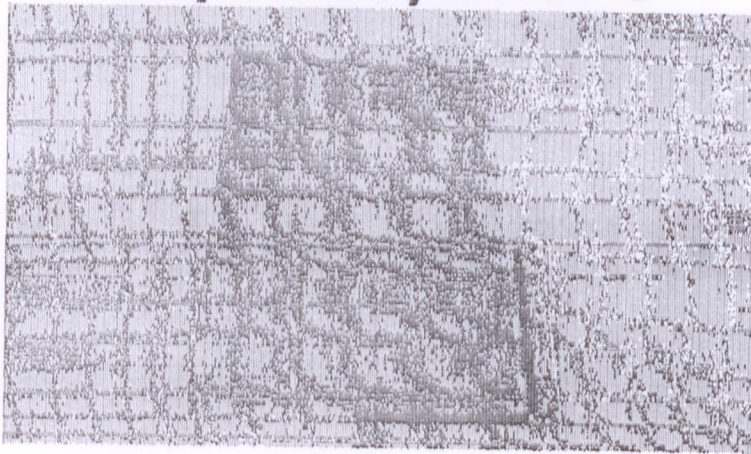
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